d. Remarks

AMENDMENTS

The amendments to claims 1 and 13 are, e.g., supported by Figure 3B and from page 7, line 16, to page 8, line 6.

The amendments to claims 2 and 15 are supported, e.g., between page 8, line 26, and page 9, line 7.

The amendments to claim 14 and new claims 23 – 24 are, e.g., supported at page 7, lines 21 – 26.

OBVIOUSNESS REJECTIONS

Amended Claim 1

Amended claim 1 recites modulating steps that cause the laser to be:

> "in a lasing state during first intervals in response the input data signals having a first signal value and to be in a non-lasing state during second intervals in response to in response the input data signals having a second signal value; and wherein the first intervals are shorter than the second intervals."

In particular, the lengths of the lasing intervals produced in response to receiving the first signal value are shorter than the lengths of non-lasing intervals produced in response to receiving the second signal value. Fig. 3B of the pending application illustrates an example of a modulation step that satisfies claim 1. There, the modulation produces lasing intervals (67) in response to the received input data signal value of "+1" and said lasing intervals (67) are shorter than the non-lasing intervals (66) produced in response to received input signal value of "0". In this example, the laser lases for a shorter interval than the length of a time interval for modulation when the input signal value is +1.

The Office Action cites nothing from Paiella or Christopher that teaches modulation steps in which lasing intervals responsive to one received input signal value are shorter than non-lasing intervals responsive to a second received input signal value. Indeed, at page 3, lines 5 – 7, the Office Action even states that:

> "Paiella et al. ... fails to teach receiving a stream of input data signals since Paiella et al. only uses FIG. 2 to demonstrate the operation theory."

That is, the Office Action seems to admit that Paiella does not teach a modulation method responsive to receiving a stream of first and second signal values. In the absence of such

a received stream of different first and second signal values, Paiella could not teach the above-recited feature of amended claim 1.

At page 3, lines 15 – 18, of the Office Action notes that Paiella's Figure 3(b) "shows that "lasing intervals are shorter than the non-lasing intervals." Even if Paiella's Fig. 3(b) shows lasing intervals separated by longer non-lasing intervals, these two types of intervals are not responsive to received input data signals with different first and second signal values as in amended claim 1. Indeed, Paiella's Fig. 2 appears to show a QC laser gain-switched by a comb generator that produces a stream of spikes of one type. Such a constant driver setup does not implement the above-described modulation wherein the lasing interval and non-lasing interval are responsive to different first and second received signal values. Rather, the setup of Paiella's Fig. 2 enables measuring the frequency response of the QC laser, e.g., the pulse shape and width. See, e.g., Paiella, page 781, right column, first paragraph. For these reasons, Paiella's Fig. 3 does not teach modulating with the above-recited features of amended claim 1.

In the absence of a citation of a prior art teaching for the above-recited features of amended claim 1, amended claim 1 is non-obvious.

Amended Claim 2

While amended claim 2 recites that the modulation waveform keeps the laser near a lasing-threshold, the Office Action cites no prior art teaching for such a feature. In particular, the Office Action cites no prior art for maintaining the laser near the lasing-threshold in response to the value of the input digital signals for which modulation does not produce lasing. For example, page 3, lines 15 – 18 of the Office Action do not point to any feature in the driving system of Paiella's Fig. 2 that maintains the laser near the lasing-threshold while the QC laser is not lasing. In the absence of a teaching for the above feature, pending claim 2 is non-obvious.

Claims 3 and 6 – 12

Claims 3, 7, and 9 are non-obvious, at least, by a dependence on amended claim 2.

Claims 6, 8, and 10 – 12 are non-obvious, at least, by a dependence on amended claim 1.

Claim 13

Amended claim 13 recites a modulator configured to produce modulation intervals with both a lasing portion and a non-lasing portion in response to one value of the data signal and to produce non-lasing modulation intervals in response to another value of the data signal. Fig. 3B of the pending application illustrates a modulation produced by an exemplary such modulator (44) of Fig. 3A. There, responsive to the received input data value "+1" the modulator (44) generates a modulation interval with a lasing portion (67) and a non-lasing portion (68). Also, responsive to the received input data value of "0", the modulator (44) produces a non-lasing modulation interval (66).

The Office Action cites nothing from Paiella or Christopher that teaches a modulator configured to produce modulation intervals with both lasing and non-lasing portions in response to one received input data value and to produce non-lasing modulation intervals in response to another input data value. Indeed, the Office Action even states that"

> "Paiella et al. ... fails to teach receiving a stream of input data signals since Paiella et al. only uses FIG. 2 to demonstrate the operation theory."

Thus, the Office Action seems to admit that Paiella does not teach a modulator that is responsive to a stream of different input data signals. In the absence of such a received stream of different data values, Paiella could not teach the above-recited feature of the modulator in amended claim 13.

At page 3, lines 15 – 18, of the Office Action notes that Paiella's Figure 3(b) "shows that the lasing intervals are shorter than the non-lasing intervals". Even if Paiella's Fig. 3(b) shows lasing intervals separated by longer non-lasing intervals, these first and second intervals are not responsive to received input data signals having first and second values as in amended claim 13. Thus, this portion of Paiella does not teach a modulator that is configured to modulate a laser responsive to input data as recited in amended claim 13.

In the absence of a citation of a prior art teaching for the above-recited feature of amended claim 13, amended claim 13 is non-obvious.

Claims 14 – 24

Claims 14 – 24 are non-obvious, at least, by their dependence on claim 13.

Amended Claim 15

Whereas amended claim 15 recites that the modulator is configured to maintain the laser near a lasing-threshold, the Office Action presents no prior art teaching for such a modulator. In particular, page 3, lines 15 – 18 of the Office Action do not point to any feature in the driving system of Paiella's Fig. 2 that keeps the laser near the lasing-threshold during the modulation intervals that do not produce lasing. The absence of a teaching for the above feature, provides an independent reason that amended claim 15 is non-obvious.

CONCLUSION

Applicants respectfully request allowance of claims 1 – 3 and 6 – 24 as presently amended.

In the event of any non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Lucent Technologies Deposit Account No. 12-2325** to correct the error.

Respectfully,

John McCabe

John F. McCabe, Reg. No. 42,854
Telephone: 908-582-6866

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Lucent Technologies Inc.
Docket Administrator
101 Crawfords Corner Road (Rm. 3J-219)
Holmdel, New Jersey 07733